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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,945	10/21/2005	Tetsuya Kamihara	040302-0502	5799

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FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER	
WANG, EUGENIA	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
10/19/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,945	KAMIHARA, TETSUYA	
	Examiner	Art Unit	
	EUGENIA WANG	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment received August 18, 2009:

a. Claim 2 has been cancelled as per Applicant's request. Claims 1 and 3-17 are pending.

b. The previous 112 rejection has been withdrawn in light of the amendment.

c. The core of previous rejection has been maintained with slight changes with respect to the wording made in light of the amendment. All changes to the rejection are necessitated by the amendment, thus the action is final.

Request for Interview

2. A call was made to Thomas Bilodeau (participant listed on the Interview Request Form) on September 24, 2009 in order to schedule an interview. No response was received.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1 and 3-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0003335 (Kazama et al.) in view of US 2004/0001985 (Alva).

As to claim 1, Kazama et al. teach of a fuel cell stack [1] that generates electric power and provides it to a load [9] (for example a drive source) (para 0027; fig. 1). Although not specifically shown in the figures, Kazama et al. teach of the presence of a cooling unit that supplies coolant to the stack, wherein there the temperature of the

coolant is measured by a temperature sensor (see step 32 of fig. 12; para 0088). Furthermore, Kazama et al.'s system calculates the electric power that can be generated from the fuel cell via the temperature of the coolant, compares it to the amount that is generated and adjusts the flows of the oxidant and fuel gas based off of that (figs. 11-13; para 0089-0094). It is noted that such processes are done via control unit [10], whose functional constitution is shown in fig. 2, and thus the items which have inputs into the control algorithm are linked to the control system (i.e. the temperature sensor). Furthermore, as seen in fig. 1, the control unit, as seen in fig. 1, also controls the flow of fuel (via pressure control valve [3] through S1), the flow of oxidant (via motor [5] through S2 and pressure control valve [6] through S3), and the power control unit [7] through S4), wherein the controller [10] can set a target power generation amount (fig. 1-2; para 0030; para 0032).

Kazama et al. does not specifically teach that the temperature sensor of the coolant is on the inlet of the coolant.

However Alva teaches that coolant parameters such as temperature sensors on both the inlet (inlet temperature detecting unit) and outlet of the fuel cell [10] (in order to tell how much heat is removed from the fuel cell) as well as the flow rate of the coolant, wherein such parameters will in turn be sent to a processor (control unit), which will control operation of the components of the system (para 0034). The motivation for wanting to provide such sensors with respect to the fuel cell is in order to more effectively control the system as to the needs of the fuel cell (via the circulation pump speeds and fan speeds to provide the appropriate amount of cooling/heating) (as set

forth in para 0034). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to provide sensors (temperature sensors on the inlet and outlet of the fuel cell, as well as a flow control sensor) in order to better monitor the cooling system with respect to the fuel cell and to provide better control as with respect to the fuel cell needs.

It is noted that the combination of Kazama et al. and Alva yields the same structure of the claimed invention (as Kazama et al. teaches of having a fuel cell, a cooling unit to deliver coolant to the fuel cell, and power management system that controls target power generation connected to a control unit and Alva is relied upon to render obvious the connection of temperature sensors and flow meters to a control unit to control heating/cooling (via pumps and fans). Accordingly, since the structure of the combination is the same as that of the instant application's structure, it is seen to capable of operating (and thus "configured to" operate) in the same manner (i.e. such that the control unit controls the electric power or current extracted from the fuel cell stack in accordance with the coolant temperature unit detected by the inlet temperature detecting unit and such that the control unit sets the limit value of the electric power or electric current extracted from the fuel cell stack in such a manner that the higher said coolant temperature becomes, the lower said limit value is set.)

It has been held that the recitation of an element is "capable" of performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchinson,* 69 USPQ 138.

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). See also MPEP § 2114.

The manner of operating the device does not differentiate an apparatus claim from the prior art. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

As to claim 3, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating (and thus "configured to" operate) in a manner such that the control unit sets said limit value to a fixed value until the coolant temperature reaches a prescribed temperature and lowers the limit value when the coolant temperature exceeds the prescribed temperature. Please see the

rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 4, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating (and thus "configured to" operate) in a manner such that when said coolant temperature exceeds the prescribed temperature, the control unit sets said limit value in such a manner that the extracted current becomes lower as said coolant temperature becomes higher. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 5, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating (and thus "configured to" operate) in a manner such that the control unit (1) receives the coolant temperature detected by the inlet temperature detecting unit, (2) obtains a maximum electric current allowed to be extracted from the fuel cell stack based on said coolant temperature, (3) compares a requested electric current to the maximum current allowed to be extracted, and (4) selects the smaller of the compared electric currents. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 6, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating (and thus "configured to" operate) in a manner such that the control unit (1) receives the coolant temperature detected by the inlet temperature detecting unit, (2) calculates an allowable value for the

coolant temperature difference between the inlet and outlet of the fuel cell stack based on said coolant temperature, (3) estimates the coolant temperature difference between the inlet and outlet of the fuel cell stack based the allowable value for the coolant temperature difference between the inlet and outlet of the fuel cell stack, (4) obtains a maximum electric current allowed to be extracted from the fuel cell stack based on the coolant temperature difference between the inlet and outlet of the fuel cell stack, (4) compares a requested electric current to the maximum current allowed to be extracted, and (5) selects the smaller of the compared electric currents. (It is noted that Alva renders obvious a coolant inlet temperature hooked up to a processor (control unit), wherein the control unit is capable of operating in the aforementioned manner.) Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 7, the combination of Kazama et al. and Alva has the same structure as the invention claimed, since Alva's coolant inlet temperature sensor as connected to the processor (control unit) (as rendered obvious in claim 1) is seen to be provide all that is necessary for an outlet estimating unit (as the control unit would be capable of doing such estimation). Accordingly, it is seen as being capable of operating in the same manner, such that the control unit (controls the electric power or electric current extracted from the fuel cell stack in accordance with the temperature of the coolant at the outlet of the fuel cell stack estimated by the outlet temperature estimating unit). Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 8, the combination of Kazama et al. and Alva has the same structure of he claimed invention, since Alva is relied upon to teach a coolant flow rate detector (as rendered obvious in claim 1). Accordingly, it is seen as being capable of operating in the same manner (such that the control unit estimates the rate at which heat is transferred from the stack to the coolant). Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 9, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating (and thus "configured to" operate) in a manner such that the outlet temperature estimating unit (control unit, as connected to the peripheral extensions, as set forth in the rejection to claim 1) estimates the coolant temperature at the outlet of the fuel cell stack based on the coolant flow rate detected by the coolant flow rate detecting unit and the heat removal rate estimated by the heat removal rate estimating unit. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 10, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating (and thus "configured to" operate) in a manner such that the heat removal rate estimating unit (control unit, as connected to the peripheral extensions, as set forth in the rejection to claim 1) estimates the heat removal rate based on the electric power or electric current extracted from the

fuel cell stack. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 11, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating (and thus "configured to" operate) in a manner such that the heat removal rate estimating unit (control unit, as connected to the peripheral extensions, as set forth in the rejection to claim 1) estimates the heat removal rate based on the electric power or electric current extracted from the fuel cell stack and the output voltage of the fuel cell stack. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 12, the combination of Kazama et al. and Alva has the same structure as the invention claimed, since Alva renders obvious the use of a coolant outlet temperature sensor as connected to the processor (control unit) (as rendered obvious in claim 1).

As to claim 13, the combination of Kazama et al. and Alva has the same structure as the invention claimed, since Alva renders obvious the use of a coolant outlet temperature sensor (indicative of stack temperature and thus serves as a stack temperature detecting unit as well) (as rendered obvious in claim 1). Accordingly, it is seen as being capable of operating (and thus "configured to" operate) in the same manner the heat removal rate estimating unit (control unit, as connected to the peripheral extensions) estimates the heat removal rate based on the electric power or electric current extracted from the fuel cell stack and the temperature of the fuel cell

stack detected by the stack temperature detecting unit. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 14, the combination of Kazama et al. and Alva has the same structure as the invention claimed, since Alva renders obvious the use of a coolant inlet and outlet temperature sensors as well as flow rate sensors to control the pumps (which controls the flow rate) by using a processor (control unit), thus constituting a coolant flow rate setting unit (as rendered obvious in claim 1). Accordingly it is capable of operating in such a manner that at least in a high load region of the fuel cell, the difference between the coolant temperature at the inlet of the fuel cell stack and the estimated coolant temperature at the outlet of the fuel cell stack increases as the output of the fuel cell increases.

As to claim 15, the combination of Kazama et al. and Alva has the same structure as the invention claimed, since Alva renders obvious the use of a coolant outlet temperature sensor (as rendered obvious in claim 1).

As to claim 16, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating in a manner such that control unit (as connected to the peripheral extensions, as set forth in the rejection to claim 1) limits the electric power or electric current extracted from the fuel cell stack when the temperature detected by the outlet temperature detecting unit exceeds a prescribed value. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

As to claim 17, the combination of Kazama and Alva, which has the same structure as the claimed invention, is capable of operating (and thus "configured to" operate) in a manner such that when the coolant temperature is rising, the control unit sets said prescribed value in such a manner that the electric power or electric current extracted from the fuel cell stack is limited based on the temperature of the coolant at the inlet of the fuel cell stack before it is limited based on the temperature of the coolant at the outlet of the fuel cell stack while the coolant temperature rises. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function.

Response to Arguments

4. Applicant's arguments filed August 18, 2009 have been fully considered but they are not persuasive.

Applicant argues that a control unit "configured to" perform certain functions imparts structure and is not intended use, wherein Applicant argues that the Federal Circuit has held that general purpose computers "programmed to" carry out certain functions is physically different than the machine without the program, wherein *In re Prater* supports such a position.

Examiner respectfully disagrees. It is first submitted that "programmed to" and "configured to" are not synonymous, as being configured can relate to the structure of the computer/controller as it is connected to its peripheral extensions. Thus, the language "configured to" is broader than Applicant's applied interpretation. Accordingly, the combination as set forth in the rejection above is seen to be "configured" in the

same manner (as combination renders obvious the use of a controller connected to the necessary peripheral extensions). There is nothing in the claim language to preclude such an interpretation, and thus the actions performed are interpreted to be functional. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function. Furthermore, office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22,13 USPQ2d, 1320, 1322 (Fed. Cir. 1989). In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the controller is programmed to carry out certain functions) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus, the arguments set forth by Applicant are irrelevant. Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

Applicant argues that (in view of the court decisions cited with respect to the argument listed above) the references applied are not configured or programmed to perform all the functions performed by the control unit of claim 1 and thus does not provide evidence that the functions that the control unit of claim 1 is configured to

perform would have been obvious and thus fails to teach the structure of the control unit.

Examiner respectfully disagrees. It is again emphasized that "programmed to" and "configured to" are not synonymous, as being configured can relate to the structure of the computer/controller as it is connected to its peripheral extensions. Thus, the language "configured to" is broader than Applicant's applied interpretation. Accordingly, the combination as set forth in the rejection above is seen to be "configured" in the same manner (as combination renders obvious the use of a controller connected to the necessary peripheral extensions). There is nothing in the claim language to preclude such an interpretation, and thus the actions performed are interpreted to be functional. Please see the rejection of claim 1 as to the Office's position on functional language as applied to apparatuses capable of performing the same function. Furthermore, office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22,13 USPQ2d, 1320, 1322 (Fed. Cir. 1989). In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the controller is programmed to carry out certain functions) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus, the

arguments set forth by Applicant are irrelevant. Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

Applicant argues that the combination of Kazama and Alva fail to render obvious certain control functions cited by the claims ("control the electric power or electric current extracted from the fuel cells tack in accordance with the coolant temperature detected by the inlet temperature detecting unit" and "to se a limit value of the electric power or electric current extracted from the fuel cell stack in such a manner that the higher said coolant temperature becomes, the lower said limit value is set").

Examiner respectfully disagrees. As set forth above the term "configured to" is broader than Applicant is reading. In such a manner, the structure obviated by the combination in the rejection is still "configured" in the same manner, wherein the functions of the controller are seen to be functional language, which does not further define the structure. See the rejection to claim 1 for the interpretation taken with respect to the claim language, as well as to the Office's position with respect to functional language applied to apparatus claims. Furthermore, see the response to the arguments above as to why the court decisions cited by Applicant are not applicable to the instant application (due to the fact that "configured to" and "programmed to" is not synonymous) (not reiterated herein for brevity's sake). Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

Applicant argues that the dependent claims are distinct from the prior art of record for the same reason as the independent claim.

Examiner respectfully disagrees. The rejection with respect to the independent claim has been maintained, and thus the rejections to the dependent claims are maintained as well.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on 7 - 4:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. W./
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795